University of Bahrain

CE -- CIT -- UOB

TEST 1 (9 Nov 2015) ITCE363: Electronics 2

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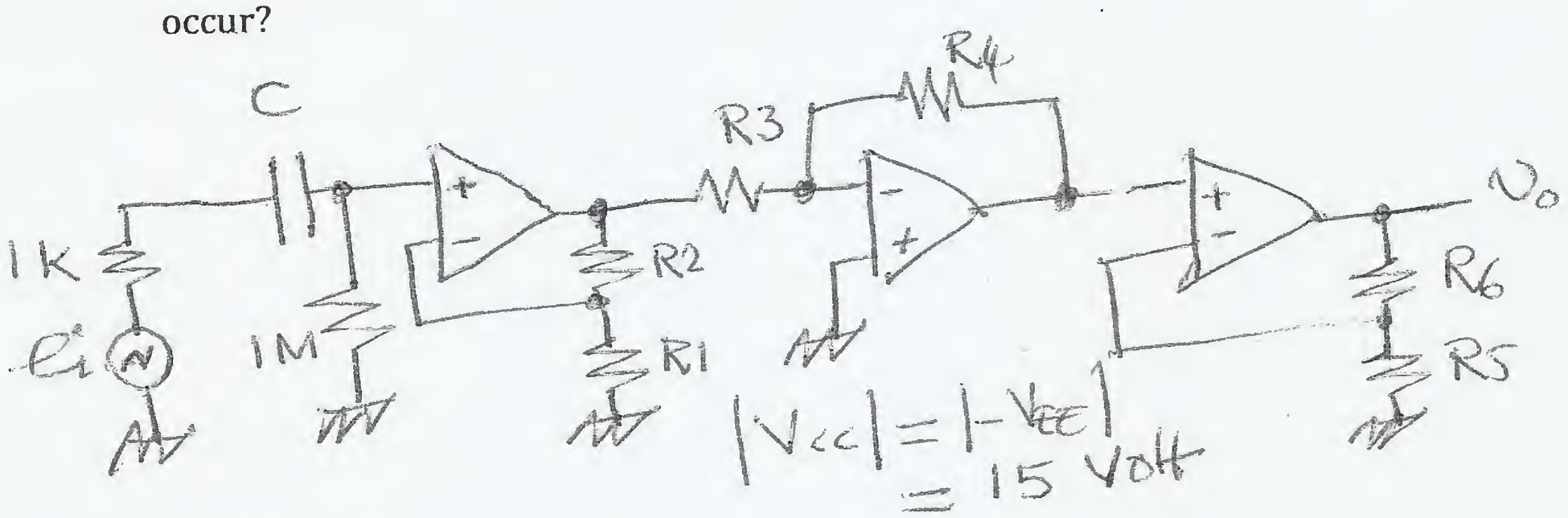
Q1. [60 marks]

In the following amplifier, the OP AMPs are 741 in which f_T = 1 MHz and slew rate = 0.5 V/μs.

1. Find R1,R2,R3,R4, R5 and R6 that make the mid-band gain value of each stage = 5
2. Find C that makes f_{LOW} cutoff freq. = 100 Hz
3. Calculate the small signal bandwidth.
4. Calculate the gain in dB at f= 10 Hz, 25 Hz, 1 kHz, 100 kHz and 250 kHz.
5. What maximum input signal amplitude can you use before **clipping** distortion starts to occur?
6. What maximum input signal frequency can you use before **slew rate** distortion starts to occur?



Q2. [40 marks]

In the following amplifier, assume R1=R2= 120 kΩ, Cc1=Cc2=C_E = ∞, L_T = 25 μH with 2 Ω internal resistance, r_{out} of the transistor= 50 kΩ, assume C_{stray} of o/p = 10 pF:

a) Find R_E for Ic = 0.5 mA. Find V_{CE}. Assume Vcc =12 volt.
b) Find C_T that tunes the amplifier at 1.5 MHz
c) Find f1, f2 and the BW of the amplifier
d) Find the voltage gain in dB at resonance and at f1 and f2.
e) If this amplifier is driving R_L = 10 kΩ, what will be the new BW and voltage gain.